

# On the status, synonymy and tribal position of *Phaeocoris* Jakovlev, 1887 (Heteroptera: Pentatomidae)

D.A. Gapon & M. Baena

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*Phaeocoris* is resurrected from synonymy with *Dymantis*. *Lodosia* is synonymized with *Phaeocoris*, and *L. gonocoxa*, with *Ph. ellipticus*. The structure of the male and female genitalia of *Phaeocoris* shows that this genus does not belong to Sciocorini, but also its placement in Myrocheini is problematic.

D.A. Gapon, Zoological Institute, Russian Academy of Sciences, Universitetskaya nab. 1, St.Petersburg 199034, Russia. E-mail: TentatDAG@yandex.ru

M. Baena, Departamento de Biología y Geología, I.E.S. Trassierra, Avda. Arroyo del Moro s/n, 14011 Córdoba, España. E-mail: jsusin@chopo.pntic.mec.es

## Introduction

The tribal classification of Pentatominae is unclear and the limits and composition of some tribes are not well defined; further studies are necessary to elucidate the systematics of the subfamily.

The tribe Myrocheini Stål, 1876 was erected to accommodate the genus *Myrochea* Amyot & Serville and another six genera. The tribe was used or not by modern authors, e.g. Linnavuori (1975, 1982), Gross (1975), Cassis & Gross (2002), and its composition has changed with the inclusion or exclusion of some genera, in some cases without explication of these actions.

Ahmad & Afzal (1989) resurrected the tribe, provided a historical review of the group and a revision of the fauna from the Indo-Pakistan subcontinent. Ahmad et al. (1996) described the first Myrocheini from the Palaearctic Region, *Lodosia gonocoxa* Ahmad & Önder, 1996. This paper was initiated after the observation of the strong resemblance in habitus between *Lodosia gonocoxa* and the little known Moroccan species *Phaeocoris andreae* Vidal, 1941.

## Material and methods

The paper is based on material from the collection of the Zoological Institute, St.Petersburg, and specimens from the Linnavuori collection, Raisio, Finland.

The following species were examined.

*Phaeocoris*: *Ph. ellipticus ellipticus* Herrich-Schaeffer, *Ph. e. alpicola* Kiritschenko.

Myrocheini: *Dymantis grisea* Jensen-Haarup, *Delegorguella vittiventris* Stål, *Ennius ater* (Dallas), *Erachteus* sp., *Laprius varicornis* (Dallas), *Myrochea aculeata* (Westwood).

Caystrini: *Caystrus brunnescens* (Distant), *C. kivuanus* Linnavuori, *C. marginiventris* (Stål), *Neodius ellenriederi* Breddin.

Sciocorini: *Sciocoris capitatus* Jakovlev, *S. cursitans* (Fabricius), *S. deltocephalus* Fieber, *S. distinctus* Fieber, *Menaccarus arenicola* Scholtz, *M. deserticola* Jakovlev, *Tisia gracilis* Hoberlandt, *Dyroderes umbraculatus* (Fabricius). Note: the structure of the male and female genitalia of *Dyroderes* (e.g. asymmetrical retractable conjunctiva) does not support its inclusion in the Sciocorini.

For the method used to inflate the aedeagi, see Gapon (2001). In the descriptions of the aedeagus structure, ventral and dorsal surfaces of aedeagal parts are distinguished according to their positions in the erected aedeagus (i.e. rotated through 180° as compared to the position in the non-copulating insect).

The following abbreviations are used in the figures: *a. b. pl* – apex of basal plate of phalobase; *a. con* – apex of conjunctiva; *a. pr* – apical processes of medial penial plates; *a. th* – apical part of theca; *b. pl* – basal plate of paramere; *b. pr* – basal process of paramere; *b. th* – basal part of theca; *c. pr* – capitate processes of phallobase; *con* – conjunctiva; *d* – dilation of spermathecal duct; *d. con* – dorsal connectives of phallobase; *d. pr* – dorsal processes of conjunctiva; *d. r. s* – dilations of ring sclerites of gynatrium; *fun* – funnel of spermathecal duct; *gyn. c* – gynatrial cone;

**Table.** Characters of the male and female genitalia in some Pentatomidae (characteristic features given in bold).

Character	<i>Phaeocoris</i>	<i>Dymantis</i> and other Myrocheini	Caystrini	Sciocorini (except <i>Dyroderes</i> )
Apex of paramere hypophysis ( <i>hyp</i> )	Bell-shaped with, process on internal surface (Fig. 1)	Pointed (Fig. 2)		Pointed, sometimes flattened (Figs 3-5)
Conjunctiva at rest ( <i>con</i> )	Lying inside the theca (Figs 6-7)			<b>Lying outside the theca</b> (Fig. 8)
Theca ( <i>b. th</i> )	Not swollen (Fig. 6)	Swollen (Fig. 7)	Not swollen	Not swollen, <b>sharply divided into basal and apical part</b> (Fig. 8)
Medial plates: longitudinal bands and apical processes ( <i>l. bd, a. pr</i> ; in Sciocorini, <i>m.p.p</i> )	Parallel to vesica (lying in parasagittal planes of aedeagus) (Figs 9-10)	<b>Perpendicular to vesica (lying in frontal planes of aedeagus)</b> (Fig. 11)	Longitudinal bands parallel to vesica (lying in parasagittal planes of aedeagus), <b>apical processes lying in cross planes</b>	Parallel to vesica (lying in parasagittal planes of aedeagus), <b>apical processes absent</b> (Fig. 12)
Ventrolateral lobes of conjunctiva ( <i>vl. l</i> )	Basal to medial plates (Figs 9-10)	<b>Absent, on their place arc ventral sclerites</b> (Fig. 11, <i>v. s</i> )	<b>Absent</b>	Basal to medial plates (Fig. 12)
Apex of conjunctiva	Not differentiated (Figs 9-10, <i>a. c</i> )	<b>With ventro-apical and long latero-apical lobes (lying apical to medial plates)</b> (Fig. 11, <i>va. l, la. l</i> )	Not differentiated	Not differentiated (Fig. 12)
Dorsal processes of conjunctiva	Absent (Fig. 10)	Present (Fig. 11, <i>d pr</i> )		Absent
Vesica ( <i>ves</i> )	Rather short (Figs 9-10)	Very short (Fig. 11)	<b>Long</b>	Very short, sometimes long (Fig. 12)
Dilations of ring sclerites ( <i>d. r. s</i> )	Present (Figs 13-14)			Absent (Fig. 15)
Dilated part of spermathecal duct	Not divided (Fig. 13, <i>d</i> )	Divided into tubular and swollen part (Figs 14-15, <i>tub. d, sw. d</i> )		

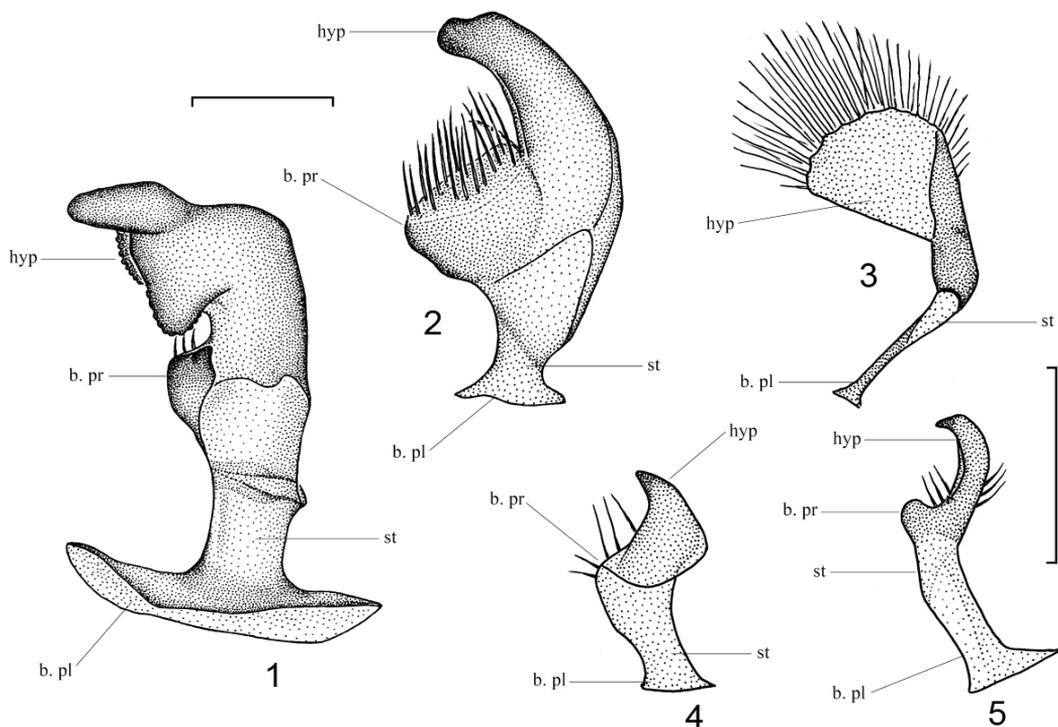
*hyp* – hypophysis of paramere; *l. bd* – longitudinal bands of medial penal plates; *la. l* – latero-apical lobes of conjunctiva; *m. p. p* – medial plates of penis; *r. s* – ring sclerites of gynatrium; *res* – reservoir of spermatheca; *st* – stalk of paramere; *sw. d* – swollen part of dilation of spermathecal duct; *tub. d* – tubular part of dilation of spermathecal duct; *v. pr* – ventral processes of phallobase; *v. s* – ventral sclerites of conjunctiva; *v. sw* – ventral swellings of theca; *va. l* – ventro-apical lobe of conjunctiva; *ves* – vesica; *vl. l* – ventro-lateral lobes of conjunctiva. Scale lines in all figures correspond to 0.25 mm.

### Genus *Phaeocoris* Jakovlev, 1887, gen. dist.

*Phaeocoris* Jakovlev, 1887: 306. Type species by monotypy: *Phaeocoris semenowi* Jakovlev, 1887 (= *Aelia elliptica* Herrich-Schaeffer, 1840). *Timuria* Horváth, 1903a: 402 (syn. Horváth, 1903b: 555).

Type species by monotypy: *Timuria melanocera* Horváth, 1903 (= *Aelia elliptica* Herrich-Schaeffer, 1840). *Tancreisca* Jensen-Haarup, 1937: 169 (syn. Kiritshenko, 1952: 154). Type species by original designation: *Tancreisca breddini* Jensen-Haarup, 1937 (= *Aelia elliptica* Herrich-Schaeffer, 1840). *Lodosia* Ahmad & Önder in Ahmad et al., 1996: 256, **syn. n.** Type species by original designation: *Lodosia gonocoxa* Ahmad & Önder, 1996 (= *Aelia elliptica* Herrich-Schaeffer, 1840).

*Status and synonymy of Phaeocoris.* Herrich-Schaeffer (1840) described *Aelia elliptica* from “Siberia”. Stål (1865) considered this type locality erroneous and placed the species in the African genus *Dymantis* Stål, 1861 as a junior synonym of *D. planus* (Fabricius, 1803). Jakovlev (1887) described *Phaeocoris* for a new species *Ph. semenowi* from Altai; this name proved to be a junior synonym of *Aelia elliptica*. *Phaeocoris* was considered a separate genus until Kerzhner



**Figs 1-5.** Right paramere. 1, *Phaeocoris ellipticus*; 2, *Dymantis grisea*; 3, *Sciocoris deltocephalus*; 4, *Tisia gracilis*; 5, *Menaccarus deserticola*.

(1972) synonymized it with *Dymantis* Stål, 1861 on the basis of similar habitus.

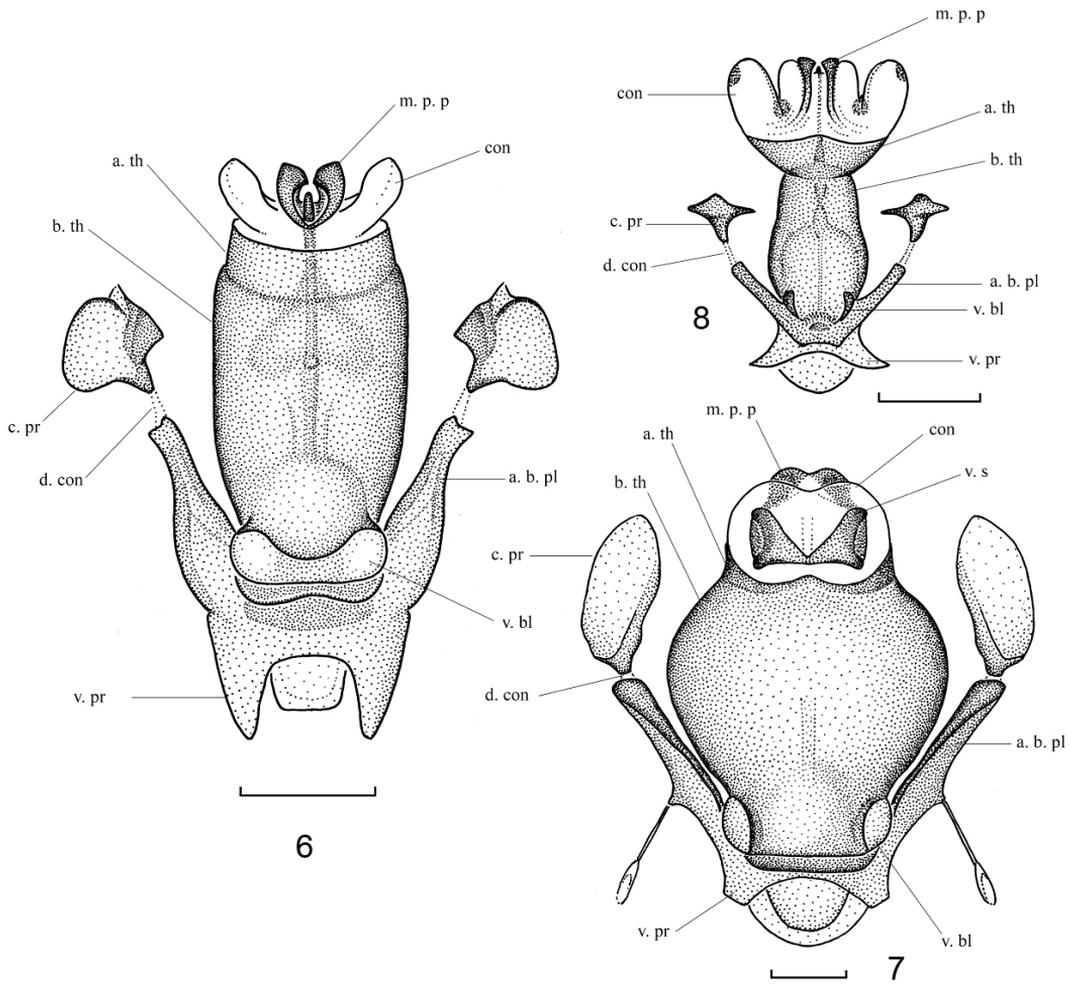
Our observations show that *Phaeocoris* and *Dymantis* are not congeneric. *Phaeocoris* differs from *Dymantis* in the following external characters. The head is subtriangular in *Phaeocoris*, whereas it is elliptical in *Dymantis*. Antennal segments of *Phaeocoris* are thicker than those of *Dymantis*. The rostrum of *Phaeocoris* is slender, with segment 1 not reaching prosternum and segments 1 and 2 each shorter than segments 3 and 4 combined; in *Dymantis*, rostral segment 1 reaches or surpasses the fore margin of prosternum, segments 1 and 2 each are longer than segments 3 and 4 combined. Laminate edges of the head, pronotum and hemelytra are blunt in *Phaeocoris* and very sharp in *Dymantis*. The white longitudinal band on the head, pronotum and scutellum is narrower in *Phaeocoris* as compared to *Dymantis*. Fore femur of *Dymantis* bears a row of small, but distinct setiferous tubercles; in *Phaeocoris*, these tubercles are a few and hardly discernible. The posterior corners of connexival segments bear a small tooth in *Dymantis*, as distinct from *Phaeocoris*. The pygophore of

*Phaeocoris* is without median projection as distinct from *Dymantis*. Even more essential differences are found in the structure of the male and female internal ectodermal genitalia (see the description below and the Table).

*Lodosia*, judging from the original description, does not differ from *Phaeocoris*, and, in our opinion, even their type species are synonymous.

**Male genitalia of *Phaeocoris*.** Paramere (Fig. 1) with very wide basal plate and long stalk. Basal process of paramere small, pointed at apex, curved toward midline of body, bearing several short setae. Apex of paramere hypophysis bell-shaped; the edge of this bell on internal surface of paramere with a process tapering to apex. Membrane connecting the paramere to the wall of pygophore with a sclerite (lateral plate).

Apices of basal plates of phallobase short, less than half as long as theca (Fig. 6). Dorsal edge of the phallobase bridge convex, angulate. Ventral processes of phallobase long and pointed at apex. Dorsal connectives rather long. Capitulate processes with minute pedicels and narrowed dorsoventrally plates. Theca C-shaped, with almost paral-



**Figs 6-8.** Aedeagus in rest, ventral view. **6,** *Phaeocoris ellipticus*; **7,** *Dymantis grisea*; **8,** *Sciocoris deltocephalus*.

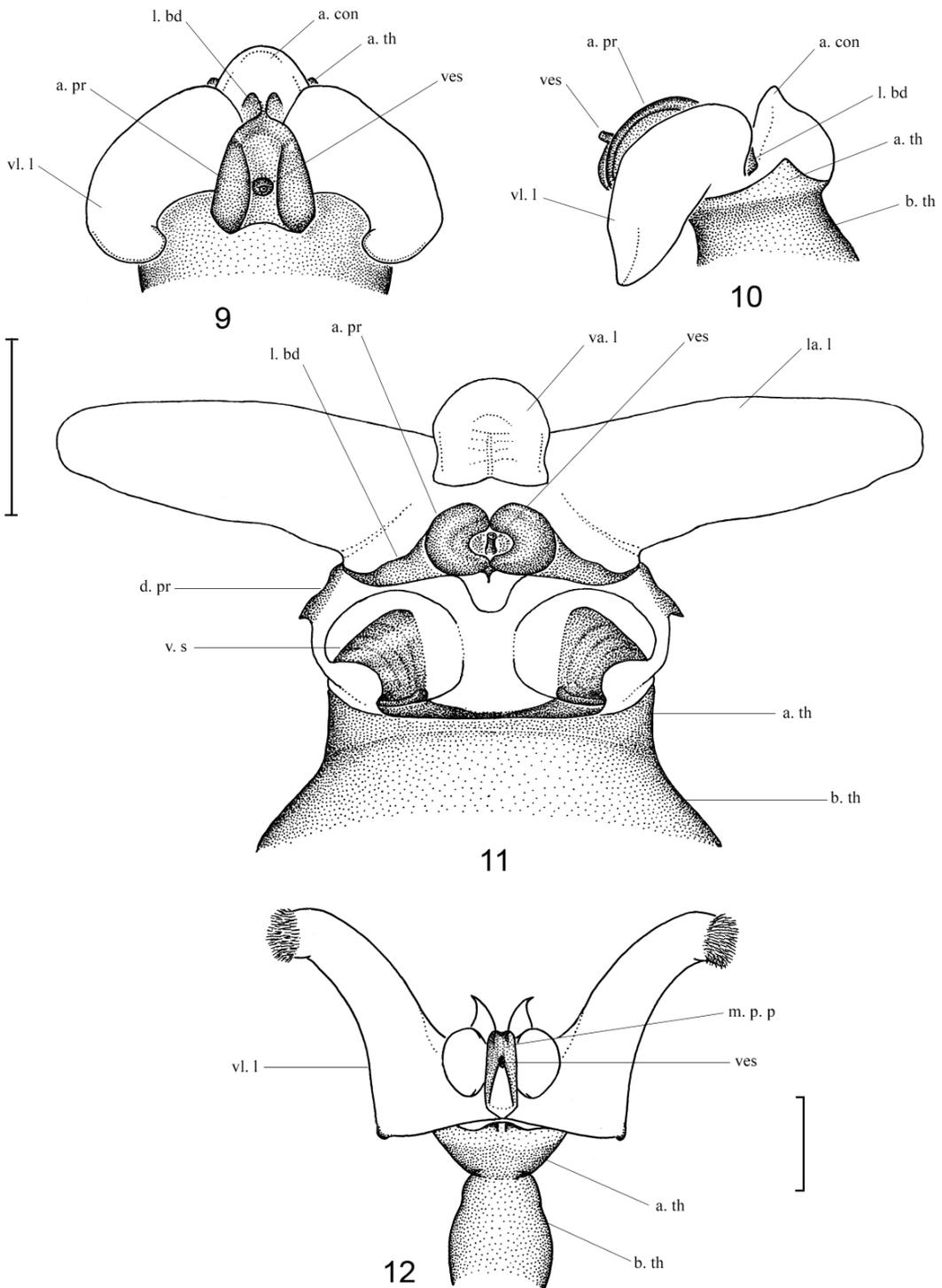
lel lateral edges. Apical part of theca rather long, not clearly delimited from basal part. Thecal base with paired membranous ventral swellings. Conjunctiva with paired ventrolateral lobes directed laterad (Figs 9-10); their pointed apices bent towards each other. Apex of conjunctiva looking like a low dome. Dorsal processes absent. Medial plates of penis formed by short, adjoining longitudinal bands and wide apical processes parallel to vesica (lying in parasagittal planes of aedeagus). Vesica short, slightly extending beyond edges of apical processes.

*Female genitalia of Phaeocoris* (Fig. 13). Base of gynatrial cone with paired large dilations of ring sclerites directed caudad. Ring sclerite very small. Spermatheca begins from gynatrial cone by a thin and moderately long duct. This duct

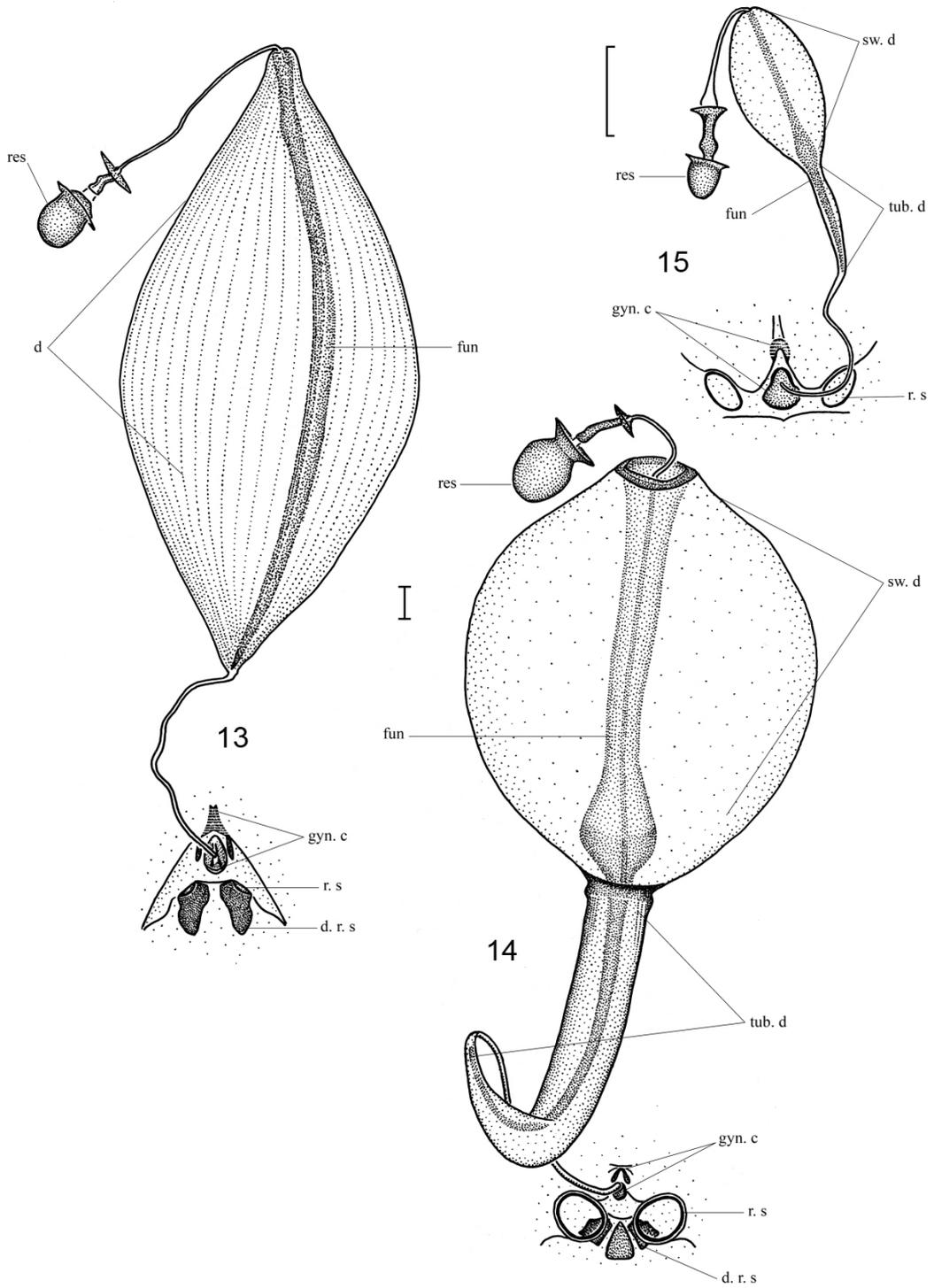
transforms to very long membranous dilation not subdivided into two parts. Inside this dilation, there is a sclerotized invaginated funnel enveloping a thin duct, which, at some distance, opens in the spermathecal reservoir (bulb). Reservoir without diverticula.

*Tribal position of Phaeocoris.* The tribal position of the genus is a matter of controversy. Kirkaldy (1909) catalogued *Phaeocoris* in the broadly conceived tribe Pentatomini, but its synonym *Timuria*, in the tribe Sciocorini, in which it was placed by Horváth (1903). *Dymantis*, with which *Phaeocoris* was synonymized by Kerzhner (1972), belongs to Myrocheini, and Ahmad et al. (1996) placed *Lodosia* in Myrocheini.

Pentatominae with laminate sides of pronotum and a longitudinal furrow on mesosternum are



**Figs 9-12.** Completely inflated aedeagus. **9, 10**, *Phaeocoris ellipticus* (9, ventral view; 10, lateral view); **11**, *Dymantis grisea*, ventral view; **12**, *Sciocoris deltocephalus*, ventral view.



**Figs 13-15.** Spermatheca, dorsal view. **13,** *Phaeocoris ellipticus*; **14,** *Dymantis grisea*; **15,** *Menaccarus deserticola*.

subdivided into 3 tribes: Sciocorini, Myrocheini and Caystrini. Both characters mentioned are present in *Phaeocoris*. We did not find reliable external characters to separate these groups.

As shown in the Table, the structure of the male and female genitalia of *Phaeocoris* does not fit any of the 3 tribes. Most characters of this genus are plesiomorphic, shared with many groups of Pentatominae (position of the conjunctive at rest; shape of theca; structure of medial plates, lobes and apex of conjunctiva; absence of sclerotized plates on ventral side of conjunctiva; not divided swollen part of spermathecal duct); some characters are autapomorphic (e.g. structure of paramere). Unfortunately, our knowledge of Pentatominae genitalia is fragmentary, not sufficient for ultimate conclusions.

As temporary decision, we propose to retain *Phaeocoris* in Myrocheini, to which this genus is similar in external appearance. It is not improbable that *Phaeocoris* was among the ancestors of Myrocheini, but this cannot be confirmed currently.

**Host plants.** Specimens of *Ph. ellipticus* were collected mostly on the ground and under stones. A few specimens were collected from Poaceae, particularly *Stipa*. Much probably the bugs feed on fallen grains.

**Species included.** The genus includes two species.

### ***Phaeocoris ellipticus ellipticus***

(Herrich-Schaeffer, 1840)

(Figs 1, 6, 9, 10, 13)

*Aelia elliptica* Herrich-Schaeffer, 1840: 79. Syntypes: Siberia; lost.

*Phaeocoris semenowi* Jakovlev, 1887: 308 (syn. Horváth, 1903b: 555). Holotype: ♂, Russia, Altai, Biya River; Zoological Institute, St.Petersburg.

*Timuria melanocera* Horváth, 1903a: 403 (syn. Josifov & Kerzhner, 1967: 7). Syntypes: ♀, Mongolia (Hangai) and China (Kuku-Nor); Hungarian Museum of Natural History, Budapest.

*Tancreisca breddini* Jensen-Haarup, 1937: 170 (syn. Kerzhner, 1972: 366). Syntypes: ♂, ♀, China (Kuku-Nor); Zoological Museum, Hamburg University.

*Lodosia gonocoxa* Ahmad & Önder in Ahmad et al., 1996: 256, **syn. n.** Holotype: ♀, Turkey, Erzincan, Ahmediya, 883 km E of Ankara; Department of Entomology, Ege University, Izmir-Bornova.

**Synonymy.** We did not examine the holotype of *Lodosia gonocoxa*, but judging from the very detailed original description, including the structure of the female genitalia, it does not differ from *Ph. ellipticus*. Therefore we consider these names synonymous. The type locality of *L. gonocoxa* is situated far from the previously known westernmost records of *Ph. ellipticus* (Central Kazakhstan), but some other steppe species of Heteroptera have similar disjunctive distribution with

isolated ranges in Turkey or eastern part of Armenia and reaching in some cases to North Africa, e.g. *Ochetostethus perepelovi* Kerzhner, 1976 (Carapezza, 1997) or even the Iberian Peninsula like *Trochiscocoris hemipterus* Reuter, 1890 (Baena & Matocq, 1994). Carapezza recorded also an example on plants of the genus *Salsola*, *S. gemmascens*.

**Distribution.** Turkey (east), Kazakhstan (central and eastern part), Kyrgyzstan, Russia (southern Siberia from Altai to Transbaikalia), Mongolia, China (Xinjiang, Qinghai, Xizang). It is collected mostly in mountains and highlands.

### ***Phaeocoris ellipticus alpicola*** Kiritshenko, 1912

*Phaeocoris alpicola* Kiritshenko, 1912: 378 (downgraded by Kerzhner, 1972: 367). Holotype: ♀, Tajikistan, Zeravshan Range, Say-Narvat; Zoological Institute, St.Petersburg.

**Diagnosis.** This subspecies is not clearly differentiated from the nominotypical one. It differs in the smaller and narrower body and the structure of the paramere, but there is a clinal variability in all characters (see Kerzhner, 1972).

**Distribution.** Tajikistan; in mountains.

### ***Phaeocoris andreae*** Vidal, 1941

*Phaeocoris andreae* Vidal, 1941: 37; 1949: 139. Syntypes: ♂, ♀, Morocco, Middle Atlas, Bou Iblane.

**Diagnosis.** Judging by the original description, the species differs from *Ph. ellipticus* only in the longer head (its length is equal to width) and less transverse pronotum.

**Distribution.** Morocco. The two syntypes were collected at the height of 3000 m close to snow. The types are not examined; if extant, they are preserved in the collection of J.P. Vidal in the Institute Cherifien in Rabat. No other specimens were reported.

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